

Application Serial No. 10/576,579  
Reply to office action of June 6, 2007

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PATENT  
Docket: CU-4794

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**Amendments To The Claims**

The listing of claims presented below will replace all prior versions, and listings, of claims in the application.

**Listing of claims:**

1. (currently amended) A metal-insulator transition switching transistor, comprising:
  - a silicon substrate;
  - a gate electrode **formed directly** on the substrate;
  - a gate insulation film on the gate electrode and the silicon substrate;
  - [[a]] an abrupt** metal-insulator-transition channel layer on the gate insulation film, wherein the **abrupt** metal-insulator-transition channel layer changes from an insulator phase to a metal phase **abruptly**, or vice versa, depending on a variation of an electric field; and
  - a source and a drain being contacted with both sides of the **abrupt** metal-insulator-transition channel layer, respectively.
2. (currently amended) The metal-insulator-transition switching transistor as claimed in claim 1, wherein the substrate is ~~a silicon substrate~~ **made of silicon**.
3. (original) The metal-insulator-transition switching transistor as claimed in claim 1, wherein the source and the drain is a double layer constituted by materials selected from the group consisting of either a chrome (Cr) layer and a gold (Au) layer or a tungsten (W) layer and a titanium (Ti) layer.

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4. (currently amended) The metal-insulator-transition switching transistor as claimed in claim 1, wherein the abrupt metal-insulator-transition channel layer is composed of a vanadium dioxide ( $\text{VO}_2$ ) thin film.

5. (withdrawn) A method for manufacturing a metal-insulator-transition switching transistor, comprising the steps of forming a gate electrode on a silicon substrate; forming a gate insulation film on the silicon substrate and the gate; forming a source electrode and a drain electrode on the gate insulation film; and forming a metal-insulator-transition channel layer between the source and the drain electrodes.

6. (withdrawn) The method for manufacturing a metal-insulator transition switching transistor as claimed in claim 5, wherein the source and the drain is a double layer constituted by materials selected from the group consisting of either a chrome (Cr) layer and a gold (Au) layer or a tungsten (W) layer and a titanium (Ti) layer.

7. (withdrawn) The method for manufacturing a metal-insulator-transition switching transistor as claimed in claim 5, wherein the step of forming the source and the drain is performed by using a lift-off process.

8. (withdrawn) The method for manufacturing a metal-insulator-transition switching transistor as claimed in claim 5, wherein the metal-insulator-transition channel layer is formed using a vanadium dioxide ( $\text{VO}_2$ ) thin film.

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9. (withdrawn) The method for manufacturing a metal-insulator-transition switching transistor as claimed in claim 8, the VO<sub>2</sub> thin film is grown at a growth temperature in the range of 450 °C to 470 °C and with an oxygen flow variation in the range of 5 to 6 SCCM.